

SEQUENCE LISTING

(1) GENERAL INFORMATION:

5 (i) APPLICANT: Robert G. Ulrich,
Mark A. Olson
Sina Bavari

10 (ii) TITLE OF INVENTION: Bacterial Superantigen
Vaccines

(iii) NUMBER OF SEQUENCES: 16

15 (iv) CORRESPONDENCE ADDRESS:
(A) ADDRESSEE: John Moran
(B) STREET: US Army MRMC -504 Scott Street
MCMR-JA (John Moran-Patent Atty)
(C) CITY: FORT DETRICK
(D) STATE: MARYLAND
20 (E) COUNTRY: USA
(F) ZIP: 21702-5012

(v) COMPUTER READABLE FORM:
25 (A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: Apple Macintosh
(C) OPERATING SYSTEM: Macintosh 7.5
(D) SOFTWARE: Microsoft Word 6.0

30 (vi) CURRENT APPLICATION DATA:
(A) APPLICATION NUMBER:
(B) FILING DATE:
(C) CLASSIFICATION:

35 (vii) PRIOR APPLICATION DATA:
35 (A) APPLICATION NUMBER:
(B) FILING DATE:

(viii) ATTORNEY/AGENT INFORMATION:
40 (A) NAME: Moran, John
(B) REGISTRATION NUMBER: 26,313
(C) REFERENCE/DOCKET NUMBER:

45 (ix) TELECOMMUNICATION INFORMATION
(A) TELEPHONE: (301) 619-2065
(B) TELEFAX: (301) 619-7714

SEQ ID NO:1:

50 Staphylococcal enterotoxin A vaccine A489270P, periplasmic
Gene sequence:

1 ATGAAAAAAA CAGCATTAC ATTACTTTA TTCATTGCC TAACGTTGAC
 ACAAGTCCA

5 61 CTTGTAAATG GTAGCGAGAA AAGCGAAGAA ATAAATGAAA AAGATTTGCG
 AAAAAAGTCT

10 121 GAATTGCAGG GAACAGCTTT AGGCAATCTT AAACAAATCT ATTATTACAA
 TGAAAAAGCT

15 181 AAAACTGAAA ATAAAGAGAG TCACGATCAA TTTCGACAGC ATACTATATT
 GTTTAAAGGC

20 241 TTTTTACAG ATCATTCTG GTATAACGAT TTATTAGTAC GTTTGATTC
 AAAGGATATT

25 301 GTTGATAAAAT ATAAAGGGAA AAAAGTAGAC TTGTATGGTG CTTATGCTGG
 TTATCAATGT

30 361 GCGGGTGGTA CACCAAACAA AACAGCTTGT ATGTATGGTG GTGTAACGTT
 ACATGATAAT

35 421 AATCGATTGA CCGAAGAGAA AAAAGTGCCG ATCAATTAT GGCTAGACGG
 TAAACAAAAT

40 481 ACAGTACCTT TGGAAACGGT TAAAACGAAT AAGAAAAATG TAACTGTTCA
 GGAGTTGGAT

45 541 CTTCAAGCAA GACGTTATTT ACAGGAAAAA TATAATTAT ATAACCTCTGA
 TGTTTTGAT

50 601 GGGAAAGGTTCA AGAGGGGATT AATCGTGTCTA CATACTTCTA CAGAACCTTC
 GGTAAATTAC

55 661 GATTTATTTG GTGCTCAAGG ACAGTATTCA AATACACTAT TAAGAATATA
 TAGAGATAAT

60 721 AAAACGATTA ACTCTGAAAA CATGCATATT GATATATATT TATATAACAAG
 TTAAACATGG

65 781 TAGTTTGAC CAACGTAATG TTCAGATTAT TATGAACCGA GAATAATCTA

SEQ ID NO: 2
 Staphylococcal enterotoxin A vaccine A489270P, periplasmic:
 Amino acid sequence

1 MKKTAFTLLL FIALTLLTSP LVNGSEKSEE INEKDLRKKS ELQGTALGNL

5 51 KQIYYYNEKA KTENKESHDO FRQHTILFKG FFTDHWSYND LLVRFDSKDI

10 101 VDKYKGKKVD LYGAYAGYQC AGGTPNKTAC MYGGVTLHDN NRLTEEKKVP

151 INLWLDGKQN TVPLETVKTN KKNVTVQELD LQARRYLQEK YNLYNSDVFD

201 GKVQRGLIVF HTSTEPSVNY DLFGAQGQYS NTLLRIYRDN KTINSENMHI

5 251 DIYLYTS

SEQ ID NO: 3

Staphylococcal enterotoxin A vaccine A489270C, cytoplasmic
Gene sequence:

10 74 ATGAGAA AAGCGAAGAA ATAAATGAAA AAGATTGCG
AAAAAAAGTCT

15 121 GAATTGCAGG GAACAGCTTT AGGCAATCTT AAACAAATCT ATTATTACAA
TGAAAAAGCT

181 AAAACTGAAA ATAAAGAGAG TCACGATCAA TTTCGACAGC ATACTATATT
GTTTAAAGGC

20 241 TTTTTTACAG ATCATTGTG GTATAACGAT TTATTAGTAC GTTTGATTC
AAAGGATATT

25 301 GTTGATAAAAT ATAAAGGGAA AAAAGTAGAC TTGTATGGTG CTTATGCTGG
TTATCAATGT

361 GCGGGTGGTA CACCAAACAA AACAGCTTGT ATGTATGGTG GTGTAACGTT
ACATGATAAT

30 421 AATCGATGTA CCGAAGAGAA AAAAGTGCAG ATCAATTAT GGCTAGACGG
TAAACAAAAT

481 ACAGTACCTT TGGAAACGGT TAAAACGAAT AAGAAAAATG TAACTGTTCA
GGAGTTGGAT

35 541 CTTCAAGCAA GACGTTATTT ACAGGAAAAA TATAATTAT ATAACCTGAT
TGTTTTGAT

40 601 GGGAAAGGTT AGAGGGGATT AATCGTGTCT CATACTTCTA CAGAACCTTC
GGTTAATTAC

661 GATTTATTG GTGCTCAAGG ACAGTATTCA AATACACTAT TAAGAATATA
TAGAGATAAT

45 721 AAAACGATTA ACTCTGAAAA CATGCATATT GATATATATT TATATACAAG
TTAACATGG

781 TAGTTTGAC CAACGTAATG TTCAGATTAT TATGAACCGA GAATAATCTA

SEQ ID NO: 4

Staphylococcal enterotoxin A vaccine A489270C, cytoplasmic
Amino acid sequence

1 MEKSEE INEKDLRKKS ELQGTALGNL KQIYYYNEKA KTNKESHDQ
 47 FRQHTILFKG FFTDHSWYND LLVRFDSKDI VDKYKGKKVD LYGAYAGYQC
 5 97 AGGTPNKTAC MYGGVTLHDN NRLTEEKV P INLWLDGKQN TVPLETVKTN
 147 KKNVTVQELD LQARRYLQEK YNLYNSDVFD GKVQRLIVF HTSTEPSVNY
 10 197 DLFGAQGQYS NTLLRIYRDN KTINSENMHI DIYLYTS

SEQ ID NO: 5

Staphylococcal enterotoxin B vaccine B2360210
Gene sequence:

15 1 GAACTAGGTA GAAAAATAAT TATGAGAAAA CACTATGTTG TTAAAGATGT
 51 51 TTTCGTATAT AAGTTAGGT GATGTATAGT TACTTAATT TAAAAGCATA
 20 101 ACTTAATTAA TATAAATAAC ATGAGATTAT TAAATATAAT TAAGTTCTT
 151 TTAATGTTTT TTTAATTGAA TATTTAAGAT TATAACATAT ATTTAAAGTG
 25 201 TATCTAGATA CTTTTGGGA ATGTTGGATA AAGGAGATAA AAAATGTATA
 251 AGAGATTATT TATTCACAT GTAATTGAA TATTCGCAC T GATATTAGTT
 30 301 ATTTCTACAC CCAACGTTT AGCAGAGAGT CAACCAGATC C TAAACCAGA
 351 TGAGTTGCAC AAATCGAGTA AATTCACTGG TTTGATGGAA GATATGAAAG
 401 401 TTTTGTATGA TGATAATCAT GTATCAGCAA TAAACGTTAA ATCTATAGAT
 451 451 CAATTCTAT ACTTGACTT AATATATTCT ATTAAGGACA CTAAGTTAGG
 501 501 GGATTATGAT AATGTTCGAG TCGAATTAA AAACAAAGAT TTAGCTGATA
 551 551 AATACAAAGA TAAATACGTA GATGTGTTG GAGCTAATT A TTATTATCAA
 40 601 601 TGTTATTTT CTAACAAAC GAATGATATT AATTGCAC TAAACTGACAA
 651 651 ACGAAAAACT TGTATGTATG GTGGTGTAAAC TGAGCATAAT GGAAACCAAT
 45 701 701 TAGATAAATA TAGAAGTATT ACTGTTGGG TATTGAGA TGGTAAAAT
 751 751 TTATTATCTT TTGACGTACA AACTAATAAG AAAAAGGTGA CTGCTCAAGA
 801 801 ATTAGATTAC CTAACCTCGTC ACTATTGGT GAAAATAAA AAACCTATG
 50 851 851 AATTAAACAA CTCGCCTTAT GAAACGGGAT ATATTAAATT TATAGAAAAT
 901 901 GAGAATAGCT TTTGGTATGA CATGATGCCT GCACCAGGAG ATAAATTG

951 CCAATCTAAA TATTTAATGA TGTACAATGA CAATAAAATG GTTGATTCTA
 1001 AAGATGTGAA GATTGAAGTT TATCTTACGA CAAAGAAAAA GTGAAATTAT
 5 1051 ATTTTAGAAA AGTAAATATG AAGAGTTAGT AATTAAGGCA GGCACCTATA
 1101 GAGTACCTGC CTTTTCTAAT ATTATTTAGT TATAGTTATT TTTGTTATAT
 10 1151 CTCTCTGATT TAGCATTAAAC CCCTTGTGTC CATTATAGTT TTCACCAACT
 1201 TTAGCTGAAA TTGGGGGATC ATTATTTATCT TTACTATGGA TAGTTACTGT
 15 1251 GTCGCCGTTT TTAACGATTT GTTCTCTTT TAATTTGTCA GTTAATTTTT
 1301 TCCATGCATC ATTTGCGTCA AACCTATTTT CATTGGATT TATTCTTGAC
 1351 AAATCAATTTC TTTTAACACT ATCGGTATTA ATCGGCTTGT TATTAAAATT
 20 1401 ACTAAGTTCA TCTAAATCAG CTGTACCCGT AATACTACTT TCGCCACCAC
 1451 TATTAAATT GTACGTAACA CCAACTGTCT CATTGCTGT TTTATCGATA
 25 1501 ATATTGCTT CTTCAAAGC ATCTCTTACA TTTTCCATA AGTCTCTATC
 1551 TGTTATTTCA GAAGCCTTG CAACGTTATT AATACCATTA TAATTTGAAG
 1601 AAGAATGAAA ACCTGAACCT ACTGTTGTTA AAACCTAAAGC ACTTGCTATC
 30 1651 AATGTTCTTG TTAATAGTTT TTTATTCTT TTATTTCTC CTATAACTTA
 1701 TTTGCAATCG AT

35 **SEQ ID NO: 6**

Staphylococcal enterotoxin B vaccine, B2360210

Amino acid sequence:

40 MYKRLFISHVILIFALILV¹⁰ISTPNVLAES²⁰QPDPKPDELHK³⁰SSKF
 TGLMEDMKVLYDDNHV⁵⁰SAINVKS⁶⁰SID⁷⁰FLYFDL⁸⁰IYSIKDTKL⁹⁰GDYDN¹⁰⁰VRVEFKNKDLAD
 KYKDKYVDVFGANYYYQCYFSKKTNDIN¹¹⁰SHQTDKRKTG¹²⁰MYGGVTEHNGN¹³⁰QLDKYRSIT¹⁴⁰
 45 VRVFEDGKNL¹⁵⁰LSFDVQTNKKVTAQELDYL¹⁶⁰TRH¹⁷⁰YLVKNKK¹⁸⁰LYEFNNSPYETGYIKFIE
 NENSFWYDMMPAPGDKFAQSKYLM¹⁹⁰MMYNDNKMVD²⁰⁰SKDVKIEVYL²¹⁰TTKKK

50 **SEQ ID NO: 7**

Staphylococcal enterotoxin B vaccine, B899445P, periplasmic
Gene sequence:

1 GAACTAGGTA GAAAAATAAT TATGAGAAAA CACTATGTTG TTAAAGATGT
 51 TTTCGTATAT AAGTTAGGT GATGTATAGT TACTTAATT TAAAAGCATA
 5
 101 ACTTAATTAA TATAAATAAC ATGAGATTAT TAAATATAAT TAAGTTTCTT
 151 TTAATGTTT TTTAATTGAA TATTTAAGAT TATAACATAT ATTAAAGTG
 10 201 TATCTAGATA CTTTTGGGA ATGTTGGATA AAGGAGATAA AAAATGTATA
 251 AGAGATTATT TATTCACAT GTAATTGAA TATTGCACT GATATTAGTT
 15 301 ATTTCTACAC CCAACGTTT AGCAGAGAT CAACCAGATC CTAAACCAGA
 351 TGAGTTGCAC AAATCGAGTA AATTCACTGG TTTGATGGAA AATATGAAAG
 401 TTTTGTATGA TGATAATCAT GTATCAGCAA TAAACGTTAA ATCTATAGAT
 20 451 CAATTCGAT ACTTTGACTT AATATATTCT ATTAAGGACA CTAAGTTAGG
 501 GAATTATGAT AATGTTCGAG TCGAATTAA AAACAAAGAT TTAGCTGATA
 25 551 AATACAAAGA TAAATACGTA GATGTGTTG GAGCTAATGC TTATTATCAA
 601 TGTGCTTTT CTAACAAAC GAATGATATT AATTGCACTC AAACGACAA
 651 ACGAAAAACT TGTATGTATG GTGGTGTAAC TGAGCATAAT GGAAACCAAT
 30 701 TAGATAAATA TAGAAGTATT ACTGTTCGGG TATTTGAAGA TGGTAAAAAT
 751 TTATTATCTT TTGACGTACA AACTAATAAG AAAAAGGTGA CTGCTCAAGA
 801 ATTGAGATTAC CTAACTCGTC ACTATTTGGT GAAAATAAA AACTCTATG
 35 851 AATTAAACAA CTCGCCTTAT GAAACGGGAT ATATTAAATT TATAGAAAAT
 901 GAGAATAGCT TTTGGTATGA CATGATGCCT GCACCAGGAG ATAAATTGAA
 40 951 CCAATCTAAA TATTTAATGA TGTACAATGA CAATAAAATG GTTGATTCTA
 1001 AAGATGTGAA GATTGAAGTT TATCTTACGA CAAAGAAAAA GTGAAATTAT
 45 1051 ATTTTAGAAA AGTAAATATG AAGAGTTAGT AATTAAGGCA GGCACCTATA
 1101 GAGTACCTGC CTTTTCTAAT ATTATTTAGT TATAGTTATT TTTGTTATAT
 1151 CTCTCTGATT TAGCATTAAAC CCCTTGTGTC CATTATAGTT TTCACCAACT
 50 1201 TTAGCTGAAA TTGGGGGATC ATTTTATCT TTACTATGGA TAGTTACTGT
 1251 GTCGCCGTTC TTAACGATTT GTTTCTCTT TAATTGTCA GTTAATTGAA

1301 TCCATGCATC ATTTGCGTCA AACCTATTTC CATTGGATT TATTCTTGAC
 1351 AAATCAATTTC TTTAACACT ATCGGTATTA ATCGGCTTGT TATTAATT
 5 1401 ACTAAGTTCA TCTAAATCAG CTGTACCCGT AATACTACTT TCGCCACCAT
 1451 TATTTAAATT GTACGTAACA CCAACTGTCT CATTGCTGT TTTATCGATA
 10 1501 ATATTTGCTT CTTTCAAAGC ATCTCTTACA TTTTCCATA AGTCTCTATC
 1551 TGTTATTCA GAAGCCTTG CAACGTTATT AATACCATTA TAATTGAAG
 15 1601 AAGAATGAAA ACCTGAACCT ACTGTTGTTA AAACTAAAGC ACTTGCTATC
 1651 AATGTTCTTG TTAATAGTTT TTATTTCATT TTATTTCTC CTATAACTTA
 1701 TTTGCAATCG AT

20

SEQ ID NO: 8

Staphylococcal enterotoxin B vaccine, B899445P, periplasmic
Amino acid sequence:

25 MYKRLFISHVILIFALILVISTPNVLAESQPDPKPDELHKSSKF⁴⁰
 TGLMENMKVLYDDNHVSAINVKSIDQFRYFDL⁵⁰ IYSIKDTKLGNYDNVRVEFKNKDLAD
 30 KYKDKYVDVFGANAYYQQAFSKKTNDINSHQTDKRKT⁶⁰ GMYGGVTEHNGNOLDKYRSIT/
 VRVFEDGKNILSFDV⁷⁰ QTNKKVTAQELDYL⁸⁰ TRHYLVKNKKLYEFNNSPYETGYIKFIE
 NENSFWYDMMPAPGDKFDQSKYLM⁹⁰ MYNDNKM/DSKDVKIEVYLTTKKK

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SEQ ID NO: 9

Staphylococcal enterotoxin B vaccine, B899445C, cytoplasmic
Gene sequence:

40 325 ATGAGT CAACCAGATC CTAAACCAGA
 351 TGAGTTGCAC AAATCGAGTA AATTCACTGG TTTGATGGAA AATATGAAAG
 45 401 TTTTGTATGA TGATAATCAT GTATCAGCAA TAAACGTTAA ATCTATAGAT
 451 CAATTTCGAT ACTTTGACTT AATATATTCT ATTAAGGACA CTAAGTTAGG
 501 GAATTATGAT AATGTTCGAG TCGAATTAA AAACAAAGAT TTAGCTGATA
 50 551 AATACAAAGA TAAATACGTA GATGTGTTG GAGCTAATGC TTATTATCAA
 601 TGTGCTTTT CTAAAAAAAC GAATGATATT AATTCGCATC AACTGACAA

651 ACGAAAAACT TGTATGTATG GTGGTGTAAAC TGAGCATAAT GGAAACCAAT
 701 TAGATAAAATA TAGAAGTATT ACTGTTCGGG TATTTGAAGA TGGTAAAAAT
 751 TTATTATCTT TTGACGTACA AACTAATAAG AAAAAGGTGA CTGCTCAAGA
 801 ATTAGATTAC CTAACTCGTC ACTATTTGGT GAAAAATAAA AACTCTATG
 851 AATTTAACAA CTCGCCTTAT GAAACGGAT ATATTAAATT TATAGAAAAT
 901 GAGAATAGCT TTTGGTATGA CATGATGCCT GCACCAGGAG ATAAATTGTA
 951 CCAATCTAAA TATTTAATGA TGTACAATGA CAATAAAATG GTTGATTCTA
 1001 AAGATGTGAA GATTGAAGTT TATCTTACGA CAAAGAAAAA GTGAAATTAT
 1051 ATTTTAGAAA AGTAAATATG AAGAGTTAGT AATTAAGGCA GGCACCTATA
 1101 GAGTACCTGC CTTTTCTAAT ATTATTTAGT TATAGTTATT TTTGTTATAT
 1151 CTCTCTGATT TAGCATTAAC CCCTTGTTGC CATTATAGTT TTCACCAACT
 1201 TTAGCTGAAA TTGGGGATC ATTTTTATCT TTACTATGGA TAGTTACTGT
 1251 GTCGCCGTTT TTAACGATTT GTTTCTCTTT TAATTTGTCA GTTAATTTTT
 1301 TCCATGCATC ATTTGCGTCA AACCTATTTC CATTGGATT TATTCTTGAC
 1351 AAATCAATTTC TTTAACACT ATCGGTATTA ATCGGCTTGT TATTAATT
 1401 ACTAAAGTTCA TCTAAATCAG CTGTACCCGT AATACTACTT TCGCCACCAT
 1451 TATTTAAATT GTACGTAACA CCAACTGTCT CATTGCTGT TTTATCGATA
 1501 ATATTGCTT CTTTCAAAGC ATCTCTTACA TTTTCCATA AGTCTCTATC
 1551 TGTTATTCGAAGCCTTTG CAACGTTATT AATACCATTA TAATTTGAAG
 1601 AAGAATGAAA ACCTGAACCT ACTGTTGTTA AACTAAAGC ACTTGCTATC
 1651 AATGTTCTTG TTAATAGTTT TTTATTCATT TTATTTCTC CTATAACTTA
 1701 TTTGCAATCG AT

SEQ ID NO:10

Staphylococcal enterotoxin B vaccine, B899445C, cytoplasmic
Amino acid sequence:

50 MSQPDPKPDELHKSSKFTGLMENMKVLYDDNHVSAINVKSTDQFRYFDLIVYSIKDTKL
 GNYDNVRVEFKNKLADKYKDKYVDVFGANAYYQCAFSSKTNIDINSHQTDKRKTCMYG

120
 GVTEHNGNQLDKYRSITVRVFEDGKNLLSFDVQTNKVVTAQELDYLTRHVLVKNKKL
 5
 YEFNNSPYETGYIKFLENENSFWYDMMPAPGDKFDQSKYLMYNDNKMVDSDKDVKIEV
 YLTTKKK
 130

10 **SEQ ID NO: 11**
 Staphylococcal toxic shock syndrome toxin-1 vaccine TST30
 Gene sequence:

1 TAAGGAGAAT TAAAAATGAA TAAAAAATTA CTAATGAATT TTTTTATCGT
 15 51 AAGCCCTTG TTGCTTGCAG CAACTGCTAC AGATTTACC CCTGTTCCCT
 101 101 TATCATCTAA TCAAATAATC AAAACTGCAA AAGCATCTAC AAACGATAAT
 151 151 ATAAAGGATT TGCTAGACTG GTATAGTAGT GGGTCTGACA CTTTTACAAA
 20 201 TAGTGAAGTT TTAGATAATT CCAGAGGATC TATGCGTATA AAAAACACAG
 25 251 ATGGCAGCAT CAGCTTGATA ATTTTCCGA GTCCTTATTA TAGCCCTGCT
 30 301 TTTACAAAAG GGGAAAAAGT TGACTTAAAC ACAAAAAGAA CTAAAAAAAG
 35 351 CCAACATACT AGCGAAGGAA CTTATATCCA TTTCCAAATA AGTGGCGTTA
 40 401 CAAATACTGA AAAATTACCT ACTCCAATAG AACTACCTT AAAAGTTAAG
 45 451 GTTCATGGTA AAGATAGCCC CTTAAAGTAT GGGCCAAAGT TCGATAAAAAA
 50 501 ACAATTAGCT ATATCAACTT TAGACTTTGA AATTCTGTCAT CAGCTAACTC
 35 551 AAATACATGG ATTATATCGT TCAAGCGATA AAACGGGTGG TTATTGGAAA
 60 601 ATAACAATGA ATGACGGATC CACATATCAA AGTGATTTAT CTAAAAAGTT
 65 651 TGAATAACAAT ACTGAAAAAC CACCTATAAA TATTGATGAA ATAAAAACTA
 70 701 TAGAAGCAGA AATTAATTAA TTTACCACTT T

45 **SEQ ID NO: 12**
 Staphylococcal toxic shock syndrome toxin-1 vaccine TST30
 Amino acid sequence:

50 MNKKLLMNFFIVSPLLLATTATDFTPVPLSSNQIIKTAKASTND
 NIKDLLDWYSSGSDTFTNSEVLDNSRGSMRIKNTDGSISLIIFPSPYYSPAFTKGEKV
 DLNTKRTKKSQHTSEGYIHFQISGVNTKEKLPTPIELPLKVKVHGKDSPLKYGPKFD

KKQLAISTLDFEIRHQLTQIHGLYRSSDKTGGYWKITMNDGSTYQSDLSSKKFEYNTEK
PPINIDEIKTIEAEIN..

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SEQ ID NO: 13

Staphylococcus enterotoxin C1 vaccine SEC45
gene sequence

10

1 ATCATTAAAT ATAATTAATT TTCTTTAAT ATTTTTTAA TTGAATATT

51 AAGATTATAA GATATATTTA AAGTGTATCT AGATACTTT TGGGAATGTT

15

101 GGATGAAGGA GATAAAAATG AATAAGAGTC GATTATTTTC ATGCGTAATT

151 TTGATATTCG CACTTATACT AGTTCTTTT ACACCCAACG TATTAGCAGA

20

201 GAGCCAACCA GACCCTACGC CAGATGAGTT GCACAAAGCG AGTAAATTCA

251 CTGGTTTGAT GGAAAATATG AAAGTTTTAT ATGATGATCA TTATGTATCA

301 GCAACTAAAG TTAAGTCTGT AGATAAATTG AGGGCACATG ATTTAATTAA

25

351 TAACATTAGT GATAAAAAC TGAAAATTA TGACAAAGTG AAAACAGAGT

401 TATTAATGA AGGTTTAGCA AAGAACTACA AAGATGAAGT AGTTGATGTG

30

451 TATGGATCAA ATTACTATGT AAACTGCTAT TTTTCATCCA AAGATAATGT

501 AGGTAAGTT ACAGGTGGCA AAACTTGTAT GTATGGAGGA ATAACAAAAC

551 ATGAAGGAAA CCACTTTGAT AATGGGAACG TACAAAATGT ACTTATAAGA

35

601 GTTTATGAAA ATAAAAGAAA CACAATTCT TTTGAAGTGC AACTGATAA

651 GAAAAGTGTGTA ACAGCTCAAG AACTAGACAT AAAAGCTAGG AATTTTTAA

40

701 TTAATAAAA AAATTGTAT GAGTTAACCA GTTCACCATA TGAAACAGGA

751 TATATAAAAT TTATTGAAAA TAACGGCAAT ACTTTTGTT ATGATATGAT

801 GCCTGCACCA GCGATAAGT TTGACCAATC TAAATATTAA ATGATGTACA

45

851 ACGACAATAA AACGGTTGAT TCTAAAAGTG TGAAGATAGA AGTCCACCTT

901 ACAACAAAAGA ATGGATAATG TTAATCCGAT TTTGATATAA AAAGTGAAAG

50

951 TATTAGATAT ATTTGAAAGG TAAGTACTTC GGTGCTGCC TTTTTAGGAT

1001 GCATATATAT AGATTAACCG CACTTCTAT ATTAATAGAA AGTGCAGTTA

1051 TTTATACACT CAATCTAAC TATAATAATT GGAATCATCT TCAAA

SEQ ID NO: 14

5 *Staphylococcus enterotoxin C1 vaccine SEC45*
Amino acid sequence:

MNKSRFISCVILIFALILVLFTPNVLAESQPDPTPDELHKASKF

10 TGLMENMKVLYDDHYVSATKVKSVDKFRAHDLIYNISDKKLKNYDKVTELLNEGLAK
KYKDEVVDVYGSYYVNCYFSSKDNVGKVTGGKTCMYGGITKHEGNHFDNGNLQNVLI
RVYENKRNTISFEVQTDKKSVTAQELDIKARNELINKKNLYEFNSSPYETGYIKFIEN
15 NGNTFWYDMMMPAPGDKFDQSKYLMYNDNKTVDKSVKIEVHLTTKNG"

SEQ ID NO:15

20 *Streptococcal pyrogenic exotoxin A vaccine SPEA42*
Gene sequence:

1 TCATGTTGÀ CAGCTTATCA TCGATAAGCT TACTTTCGA ATCAGGTCTA

25 51 TCCTTGAAAC AGGTGCAACA TAGATTAGGG CATGGAGATT TACCAAGACAA
101 CTATGAACGT ATATACTCAC ATCACGCAAT CGGCAATTGA TGACATTGGA
151 ACTAAATTCA ATCAATTGT TACTAACAAAG CAACTAGATT GACAACATAAT

30 201 TCTCAACAAA CGTTAATTAA ACAACATTCA AGTAACCTCC ACCAGCTCCA
251 TCAATGCTTA CCGTAAGTAA TCATAACTTA CTAAAACCTT GTTACATCAA

35 301 GGTTTTTCT TTTTGTCTTG TTCATGAGTT ACCATAACTT TCTATATTAT
351 TGACAACAA ATTGACAACCT CTTCAATTAT TTTTCTGTCT ACTCAAAGTT

40 401 TTGTTCATTT GATATAGTCT AATTCCACCA TCACTCTTC CACTCTCT
451 ACCGTCACAA CTTCATCATC TCTCACTTT TCGTGTGGTA ACACATAATC

501 501 AAATATCTTT CCGTTTTAC GCACTATCGC TACTGTGTCA CCTAAAATAT
551 ACCCCTTATC AATCGCTTCT TTAAACTCAT CTATATATAA CATATTCAT

45 601 CCTCCTACCT ATCTATTCGT AAAAGATAA AAATAACTAT TGTTTTTTT
651 GTTATTTAT AATAAAATTA TTAATATAAG TTAATGTTTT TTAAAAATAT

50 701 701 ACAATTTAT TCTATTTATA GTTAGCTATT TTTTCATTGT TAGTAATATT

751 751 GGTGAATTGT AATAACCTTT TTAAATCTAG AGGAGAACCC AGATATAAAA

801 TGGAGGAATA TTAATGGAAA ACAATAAAA AGTATTGAAG AAAATGGTAT
 851 TTTTTGTTTT AGTGACATT CTTGGACTAA CAATCTCGCA AGAGGTATTT
 5 901 GCTCAACAAG ACCCCGATCC AAGCCAACCTT CACAGATCTA GTTTAGTTAA
 951 AACACCTCAA AATATATATT TTCTTTATGA GGGTGACCCCT GTTACTCACG
 10 1001 AGAATGTGAA ATCTGTTGAT CAACTTAGAT CTCACGATTT AATATATAAT
 1051 GTTTCAGGGC CAAATTATGA TAAATTAAAA ACTGAACCTTA AGAACCAAGA
 15 1101 GATGGCAACT TTATTTAAGG ATAAAAACGT TGATATTAT GGTGTAGAAT
 1151 ATTACCATCT CTGTTATTAA TGTAAGGAAATG CAGAAAGGAG TGCATGTATC
 1201 TACGGAGGGG TAACAAATCA TGAAAGGAAT CATTAGAAA TTCCCTAAAAA
 20 1251 GATAGTCGTT AAAGTATCAA TCGATGGTAT CCAAAGCCTA TCATTTGATA
 1301 TTGAAACAAA TAAAAAAATG GTAACTGCTC AAGAATTAGA CTATAAAGTT
 1351 AGAAAATATC TTACAGATAA TAAGCAACTA TATACTAATG GACCTTCTAA
 25 1401 ATATGAAACT GGATATATAA AGTCATACC TAAGAATAAA GAAAGTTTTT
 1451 GGTTTGATTT TTTCCCTGAA CCAGAATTAA CTCAATCTAA ATATCTTATG
 30 1501 ATATATAAAG ATAATGAAAC GCTTGACTCA AACACAAGCC AAATTGAAGT
 1551 CTACCTAACCAACCAAGTAAC TTTTGCTTT TGGCAACCTT ACCTACTGCT
 1601 GGATTTAGAA ATTTTATTGC AATTCTTTA TTAATGTAAA AACCGCTCAT
 35 1651 TTGATGAGCG GTTTGTCTT ATCTAAAGGA GCTTTACCTC CTAATGCTGC
 1701 AAAATTTAA ATGTTGGATT TTTGTATTG TCTATTGTAT TTGATGGGTA
 40 1751 ATCCCATTAA TCGACAGACA TCGTCGTGCC ACCTCTAACCA CCAAAATCAT
 1801 AGACAGGAGC TTGTAGCTA GCAACTATTT TATCGTC
 45 **SEQ ID NO:16**
 Streptococcal pyrogenic exotoxin A vaccine SPEA42
 Amino acid sequence:
 MENNKKVLKKMVFVLTFLGLTISQEVAQQDPDPSQLHSSL
 50 VKNLQNIYFLYEGDPVTHENVKSVDQLRSHDLIYNVSGPNYDKLKTTELKNQEMATLFK
 DKNVDIYGVEYYHLCYLCENAERSACIYGGVTNHEGNHLEIPKKIVVKVSIDGIQSL

FDIETNKKMVTAQELDYKVRKYLTDNKQLYTNGPSKYETGYIKFIPKNKESFWFDFFP
EPEFTQSKYLMYKDNETLDSNTSQIEVYLTTK

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